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Notes from the Field: Chicahuaxtla Triqui Digital Wordlist and Preliminary Observations

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"En la cumbre de una alta montaña, y rodeada por todas partes de mixtecas, se encuentra Chicahuaztla, cabecera de parroquia, en la cual, así como en cuatro pueblos sujetos y en Copala, se habla un idioma extraño, el triqui, llamado así por la repeticion [sic] frecuente de ciertas consonantes (tr, pr, gr, etc.). ¿Los que lo hablan son mixtecas ó tienen otro origen? Se ignora; ni queda memoria siquiera de que antiguamente se hablase el triqui en la mixteca."[1]

–José Antonio Gay, *Historia de Oaxaca* (1881:54)

This article presents a 200-item list consisting of words and sample sentences from Chicahuaxtla Triqui, an Otomanguean language spoken in San Andrés Chicahuaxtla in the State of Oaxaca, Mexico. The wordlists include broad phonetic transcriptions, English glosses, Spanish cues, individual WAV recordings, and comments. Since the key to understanding Chicahuaxtla Triqui lies in the ability to distinguish tone, the list is divided into two parts: 1) a section consisting of minimal pairs with contrastive phonemic tone and/or lexical items illustrating other interesting phonological characteristics, such as tone, fortis-lenis contrasts, prenasalized velars/pre-voicing, and velar onset nasals; and 2) lexical items that evidence tonal contours but may or may not operate contrastively in the language. To date the files have not been deposited into an institutional archive, however, the present researchers plan to do so once the data are properly categorized. This project involves San Andrés Chicahuaxtla leaders, teachers, community members in addition to researchers, and graduate and undergraduate students from the University of Texas at Arlington. These digital files represent one of a number of ways to increase access not only for the Triqui community members and leaders who are interested in language conservation efforts, but also for linguists, researchers, and students who wish to learn more about the Otomanguean stock of languages.

[1] "On the peak of a high mountain and surrounded everywhere by Mixtecs, one finds Chicahuaxtla, the Parish seat where, as well as in four other villages and in Copala, a strange language is spoken, Triqui, named this way because of the frequent repetition of specific consonants (tr, pr, gr, etc.). Are the people who speak this language Mixtec or are they of some other origin? It's not known; it's not even remembered if Triqui was spoken in the Mixtec region in the past." –José Antonio Gay, Historia de Oaxaca, (1881:54) (translation mine).

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1. INTRODUCTION.[2] The Triqui language is a language spoken by the Triqui indigenous people of the State of Oaxaca, Mexico (Good 1979; Hollenbach 1977; Longacre 1952, 1957, 1959, 2004; Longacre, Edmondson & Santiago Rojas n.d.). Native speakers refer to the Chicahuaxtla Triqui language as *Nánj nï'ïn* [nã^{h5} nɯʔɯ̃],[3] "*la lengua completa*" or 'the complete language'. The Chicahuaxtla Triqui indigenous people do not have a word they use to refer to themselves collectively (Lewin Fischer & F. Sandoval Cruz 2007:13); however, they may refer to themselves as *Gui a'mi Nánj nï'ïn* or 'the people who speak the Complete Language'. The Triqui language belongs to the Mixtecan branch of languages from the Otomanguean family together with languages such as Cuicateco, in addition to approximately 30 variants of Mixtecan languages spoken in central, southern, and western Oaxaca, southern Puebla and eastern Guerrero. There are three dialects of Triqui spoken in three villages in the State of Oaxaca: San Andrés Chicahuaxtla, San Juan Copala and San Martín Itunyoso. According to 1990 census data, there were an estimated 15,000 speakers in Copala (ISO code [trc]), 2,000 speakers in Itunyoso (1983 census; ISO code [trq]) and 6,000 speakers in San Andrés Chicahuaxtla (ISO code [trs]). More recent population estimates point to a sharp decline in the number of inhabitants living in San Andrés Chicahuaxtla from the 1990s to the present. Recent communications with the leaders of San Andrés Chicahuaxtla (village leaders, pers. comm., July 2009, August 2010) estimate a total of 1,500 speakers in the village, and that number is dwindling. This figure seems to be in line with the demographic data reported by the *Instituto Nacional de Estadística y Geografía* (2010), which currently estimates the population of San Andrés Chicahuaxtla at 1,143 inhabitants.

The three dialects of the Triqui language evidence limited mutual intelligibility. According to surveys carried out by the Summer Institute of Linguistics (Lewis 2009), Triquis from Copala understand only 56% of what is said by the Triquis from Chicahuaxtla and only 64% of the Triqui language from Itunyoso. Speakers from Chicahuaxtla can under-

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[2] I would like to thank Dr. Jerry Edmondson, Professor of Linguistics at the University of Texas at Arlington, for his unwavering support and for taking the time to meet with my graduate students and me when we first initiated this project. Dr. Beth Wright, Dean of Liberal Arts, and President James Spaniolo of the University of Texas at Arlington generously provided research funds in order to make this project possible. Additional funding was provided by a Research Enhancement Grant from the University of Texas at Arlington. I would also like to thank the leaders of San Andrés Chicahuaxtla who welcomed us into their village and who enthusiastically helped us with our project on language documentation. Without their generosity, patience, and support, this project would never have been possible. I am indebted to Francisco Guerrero Garro and Harriet Goff Guerrero from the Cemanahuac Educational Community for facilitating our entrance into the village and the staff of the Instituto de Lengua y Estudios Latinoamericanos in Cuernavaca, Mexico for providing us with space and materials at the institute prior to going to Chicahuaxtla. The following graduate students participated in this research: Thelma Cabrera, Brenda Jackson, Jaha Thomas, Paul Jacob Kinzler, Aaron Lansford and Humberto Rodríguez. I would like to thank Professor Ken Rehg and the anonymous reviewers of this manuscript for their insightful recommendations and suggestions. All errors are the sole responsibility of the author. I dedicate this article to Tom, who has been a constant source of inspiration and support. A mis nuevos amigos y colegas de San Andrés Chicahuaxtla les envío mis cordiales saludos.

[3] The other Triqui variants are referred to by native speakers as Xnánj Nu' in Copala, A Stnáj Ni' in Itunyoso, or Tnanj Ni'inj in Santo Domingo del Estado (Lewin Fischer & F. Sandoval Cruz 2007:14).

stand 74% of the Copala Triqui dialect, and those from Itunyoso can understand approximately 91% of the Copala variant. Hollenbach (2005:2) notes that the Itunyoso Triquis evidence higher comprehension rates for Copala Triqui because they frequently go to Copala to sell their goods. However, given the separation of the three villages, the Triqui dialects have continued to evolve over the last 40 years, so mutual intelligibility percentages are likely lower today than was originally reported. Strong arguments can be made for classifying these "dialects" as three separate languages in their own right.

Chicahuaxtla Triqui suffers from a phenomenon that is occurring with many indigenous languages of Mexico: it is experiencing a steep decline in native speakers due to vast migrations from the village to major metropolitan areas, in addition to a sharp decrease in the numbers of younger speakers who acquire the language. Economic pressures have forced many Triquis to leave Chicahuaxtla in search of employment in other regions of Mexico, the U.S., and Canada. Triqui children who live outside the village are reticent to learn the Triqui language and prefer to speak the language of their contemporaries, usually Spanish. In addition, Triqui-Spanish bilingual speakers are beginning to use Spanish loanwords when speaking Triqui. Although Chicahuaxtla Triqui does not yet fall into the endangered language category, it is showing signs of initial language decline. It is very probable that in one or two generations, the language will disappear (Hollenbach 2005:7), thus making documentation of Chicahuaxtla Triqui urgent.

Aside from the devastating linguistic effects of migration, a recent article published by *IGABE Noticias* (Martínez 2011) posits two additional reasons for the initial decline of Triqui: television shows and radio programs are broadcast solely in Spanish, thus further reinforcing the children's belief that Triqui is inferior and that Spanish is the prestige language. Furthermore, school materials, books, and magazines are written in Spanish, so children have limited access—or no access at all—to materials written in their native language. Although political pressure from the outside has historically presented stiff opposition to indigenous language conservation efforts, Article 2.A.IV of the *Constitución Política de los Estados Unidos Mexicanos* (Cámara de Diputados del H. Congreso de la Unión, Secretary General 2011:1–2) deems each Mexican Nation as "unique and indivisible" and guarantees the right of the *pueblos* and indigenous communities to "preserve and enrich their respective languages, practices and all other elements that constitute their culture and identity." Recent efforts have been made to raise awareness about these minority languages, to encourage schools to take each child's mother tongue into consideration, and to provide ample education in his or her native language as well as the lingua franca (Lewin Fischer & F. Sandoval Cruz 2007). Consequently, the Triqui indigenous people have made great strides to preserve their cultural heritage and language. In the spring of 2011, a cultural workshop *("encuentro cultural")* held at the Bilingual Primary School of Chicahuaxtla hosted approximately 600 Triqui children from the district of Putla to provide students with opportunities to "chat, spend time together, listen to stories in the Triqui language, and enjoy regional dancing and songs" (translation mine). Martínez (2011) quotes Principal Vázquez Guzmán of the San Andrés Chicahuaxtla Primary School, who stated that the main purpose of the event was "to develop and strengthen cultural elements ... so that [the children's] mother tongues will not be lost, and to avoid losing village traditions" (translation mine). Although the event was viewed as a success, not all efforts for language conservation have been successful. Many of the Chicahuaxtla Triqui children still prefer

speaking Spanish and have a strong desire to learn English as opposed to Chicahuaxtla Triqui. Socioeconomic factors have contributed to the belief that Triqui is not a financially attractive alternative, nor is it a ticket to the outside world. More recently, exogamous marriages have also contributed to the overall decline in Triqui (Lewin Fischer & F. Sandoval Cruz 2007). Many women who marry into the Triqui community and accompany their husbands to the village find it much easier to speak Spanish than to learn the Triqui language (pers. comm.). The Triqui people, especially the village leaders, talked openly with us about their worries of language and culture loss. During our time in the village, they welcomed our project on language documentation and expressed a strong interest in future collaboration in the documentation and conservation of their language.

2. THE CURRENT REPORT. This paper presents a 200-item digital list of lexical items and sentences illustrating tonal contrasts, significant phonological and lexical characteristics of Chicahuaxtla Triqui. In addition to a description of the primary data and general observations about Chicahuaxtla Triqui, we include digital audio recordings of the language (cf. Himmelmann 2002; Crowley 2007; Olson, Ballenas & Borromeo 2009). The materials included in this presentation are as follows: 1) an introduction to Chicahuaxtla Triqui, with brief discussions of phonemes and allophones, fortis-lenis contrasts, prenasalized stops, velar onset nasals, tone, and spelling conventions; 2) word and sentence lists, including tables containing each Spanish cue given to the language consultant, an English gloss, the orthographic representation of the word or sentence in Chicahuaxtla Triqui as per writing conventions adopted by the Chicahuaxtla Triqui people in 2009, a broad phonetic transcription, and relevant notes; and 3) digitized recordings in WAV format.

2.1 SPEAKERS, DOCUMENTATION PARTICIPANTS AND PROCEDURES. The wordlist and sentences were recorded on July 27–29, 2009, and August 8–13, 2010, in San Andrés Chicahuaxtla in various locations such as private dwellings, outside, or in the village school. We acquired approximately nine hours of high definition video and audio recordings from seven different native speakers of the language. The language consultants consisted of four men and three women ranging in age from 34 to approximately 68 years old. Language consultants were provided with a detailed description of the study and were asked either to sign a letter of informed consent or to indicate their consent verbally on video and audio recordings. One consultant indicated her consent by thumbprint—a practice that is commonly used for signing legal documents in Mexico. All consultants spoke Spanish as a second language, with disparate levels of proficiency and metalinguistic awareness.

Since the interpretation of tone is dependent upon factors such as fundamental frequency and pitch, which varies from speaker to speaker, it was decided that the greater majority of the recordings presented here should be from one male consultant in order to facilitate comparison of tones. The language consultant was a 62-year-old native speaker of Chicahuaxtla Triqui. He was born and raised in San Andrés de Chicahuaxtla but currently lives and works elsewhere in Mexico. The consultant returns to the village when not working to spend time with family and friends. He also speaks Spanish fluently. Both of his parents are native speakers of the Chicahuaxtla Triqui language. The consultant's father was reported to be the first community member in Chicahuaxtla to learn Spanish in the late 1940s through the early 1950s. Unfortunately, he passed away within the last decade

preceding this research. The consultant's mother and other siblings still live in the village. He received his formal education in San Andrés Chicahuaxtla.

For each recording session the main language consultant produced the target word three times, either in isolation or in carrier sentences. At times, follow-up questions were necessary in order to get clarification or additional information on specific grammatical, tonal, and/or lexical features of the language. Carrier sentence cues were generated spontaneously not only in order to examine specific tokens we were interested in, but also to enable subsequent investigation of tonal variations in running speech. Four of the digital recordings were provided by the third author and language consultant, Felipe Santiago Rojas (Items 161, 165, 166, and 194).

The interviews were conducted mainly by the principal investigator (PI); however, seven students also participated as required for a course on language documentation. Three graduate students and one undergraduate student completed their fieldwork with the PI in San Andrés Chicahuaxtla in July 2009, and two other graduate students and one undergraduate student participated in August 2010. Two anthropologists, one Mexican and one from the United States who lives and works in Mexico, facilitated our entrance into the village. A renowned linguist and expert in tonal languages from the U.S. accompanied the group for the purpose of carrying out fieldwork in August 2010. During the recording sessions, the PI gave the Spanish prompts, one student operated the video camera, another monitored the quality of the recording with noise-canceling headphones, while the remaining students tried their hands at phonetic transcription using the International Phonetic Alphabet (IPA). Subsequent recording sessions were carried out by the students under the supervision of one of the PIs.

2.2 WORDLIST SOURCES. Several sources were consulted in the construction of the final wordlist used for data elicitation. Although the present researchers used both the 100- and 200-word versions of the Swadesh list (Swadesh 1952, 1955, 1971), both were too limited in scope to enable us to target tonal distinctions in Chicahuaxtla Triqui in the short amount of time we were in the village. The initial list was expanded, based on the *Diccionario triqui de Chicahuaxtla* (Good 1979), research on Chicahuaxtla Triqui by Longacre (1952, 1957, 1959, 2004), Matsukawa (2009) and Longacre, Edmondson & Santiago Rojas (n.d.); Hollenbach's (2005) research on Copala Triqui; and DiCanio's (2008, 2012) research on Itunyoso Triqui. In order to ascertain how much the language had changed over the past 113 years, the present researchers also used *Lenguas indígenas del Estado de Oaxaca: Ensayo sobre la lengua trike*, the first Chicahuaxtla Triqui dictionary, written in 1897 by Francisco Belmar. By examining several resources at our disposal, we were able to compile a rather extensive list of 1,232 words, many of which we were able to record in August 2009 and July 2010. The language consultants frequently contributed additional lexical items, tonally contrastive words, or personal observations that were not included in the original list. The list is in no way exhaustive, nor can it be viewed as representative of the vast richness of the Chicahuaxtla Triqui language in terms of lexicon, tonal, or grammatical features of the language. The original wordlist and sentences were compiled electronically by the PI and graduate students using the *Tables* function in Microsoft Word. Column headings included the English gloss, the word in Spanish, the Chicahuaxtla Triqui word written in accordance with the most recently approved writing system, broad IPA transcriptions, and

a column for notes, additional comments, and/or observations about the word. The digital wordlist and sentences were subsequently hand-written into hardbound notebooks as per Crowley (2007) prior to our arrival in the village.

The following criteria were used in the compilation of the final list: 1) selection of minimal pairs contrasting in tone; 2) selection of words to enable comparison to the Triqui languages spoken in Copala and Itunyoso; and 3) selection of words for subsequent comparison to Francisco Belmar's 1897 dictionary on Chicahuaxtla Triqui. The list was divided first by theme and then by targeted grammatical structures. Thematic groupings consisted of natural phenomena and the environment, familial relations, anatomy and body parts, food items, agricultural and artisanal vocabulary, salutations and expressions of courtesy, and technology and computer terminology. The list also contained sections designed to target specific grammatical structures such as verb forms and paradigms, pronouns and pronominalization, the use of definers, limiters, descriptive adjectives, relative clause formation, conjunctions, prepositions, and demonstratives (cf. Crowley 2007).

2.3 RECORDINGS. The recordings were made using a Zoom H4n portable digital recorder connected to a MACBook Pro computer using Audacity v. 1.2.6 and/or Praat v. 5.1.34 at a sampling rate of 44.1 KHz and a quantization of 16 bits (i.e., standard audio CD quality). One of the pitfalls associated with on-site recordings is background noise. We used Bias SoundSoap v. 2.1 noise canceling software to remove unwanted noise (e.g., chickens, goats, barking, thunder, talking) from several of the audio files recorded in August 2009. Upon our return to Chicahuaxtla a year later, we were given access to more secluded areas of the village in order to reduce unwanted noise and unexpected interruptions. Interviews from 2009 were videotaped using two high-definition Sony video cameras: Sony HDR-HC1 and Sony HDR-XR500. One camera was focused on the consultants' buccal region, while the other provided a panoramic view of the sessions. The 2010 interviews required the use of only one high definition video camera in addition to the audio equipment mentioned above.

The digital recordings of each item are accessible by clicking on the loudspeaker icon next to the phonetic form of each word or sentence in the lists below. The recordings are divided into two sections: Section 1 consists of minimal pairs demonstrating contrastive tone and/or lexical items that evidence interesting phonological features of the language, such as fortis-lenis contrasts in word-initial position. For example: *m* versus *mm* [m̥ m̤]; *n* versus *nn* [n̥ n̤]; *w* versus *ww* [w̥ w̤]; and *y* versus *yy* [˷j ˧˧j]; prenasalized velars; and pre-voicing and velar onset nasals in addition to glottalization. The minimal pair contrastive tone recordings contain only one token of each lexical item being compared. The PI extracted the best token for the three separate repetitions of the same word for each item included in the minimal pair recordings. For example, the Chicahuaxtla Triqui words for 'shirt', 'mold', and 'we are going to tell him' (Items 1–3) are [ᵑgato^{4} ᵑgato^{2} ᵑgatoʔ^{2}], respectively, and are presented only once in the WAV file.

Section 2 contains lexical items and/or words used in carrier sentences that evidence tonal contours but may or may not operate contrastively in the language. That is to say, they may not be phonemically contrastive or form minimal pairs with other lexical items in terms of tone, as far as the present researchers are aware. For Section 2, the lexical items are presented three consecutive times in the majority of digital recordings.

Some tokens used spontaneously in carrier sentences may have only one repetition in certain cases (cf. Section 2: Item 143 'you speak; you do speak; you are speaking' [aʔmi[2] reʔ[1]]).

3. PHONETICS AND PHONOLOGY.

3.1 CONSONANT INVENTORY. Although some articles have been written describing the phonological system of Chicahuaxtla Triqui (Longacre 1952, 1957, 1959; Hollenbach 1977), very few phonetic studies have been carried out on the language until recently (DiCanio 2008; Longacre, Edmondson & Santiago Rojas n.d.). In this section we highlight salient phonological features of Chicahuaxtla Triqui, most of which are represented by the digital recordings included in this report. It is not our intention to provide a comprehensive account of the entire phonological system of Chicahuaxtla Triqui, which has been described in previous studies carried out by Longacre (1952, 1957, 1959) and Hollenbach (1977). However, a brief sketch of prominent features of Chicahuaxtla Triqui is nevertheless warranted.

The majority of the phonemes listed in Table 1 can occur in word-initial position, with the exception of /p/, which is rare and only found in word-medial position (cf. *lupi* [lupi] '*guajolote*/turkey') and /h/, which is only found as a final-syllable coda. The phonemes /p/, /b/ (and its prenasalized, conditioned variant [ᵐb]) are not native to Chicahuaxtla Triqui and surface only in Spanish loanwords. Similar to Spanish, /b d ɡ/ in intervocalic position are pronounced as approximants or non-fricative continuants [β ð ɣ]; however, after nasals they are articulated as stops (cf. *ngaâ* [ŋga[4]] 'when', Item 78). Similar findings have been reported by Hollenbach (1977:36) and DiCanio (2010:229) for Copala and Itunyoso Triqui, respectively.

	Bilabial		Dental		Alveolar		Post-alveolar		Palatal		Retro-flex Alveo-palatal		Velar		Labio-Velar		Glottal	
Stops	/p/† [4]	/b/†	/t/	/d/									/k/	/g/	/kʷ/	/gʷ/	/ʔ/	
Prenasal-ized stops		/ᵐb/†		/ⁿd/ /nd/										/ᵑg/ /ŋg/		/ᵑgw/		
Affricates							/ts/ /tʃ/				/tʂ/							
Fricatives					/s/	/z/	/ʃ/	/ʒ/			/ʂ/						/h/	
Nasals		/m/ /m̤/				/n/ /n̤/				/ɲ/								
Liquids						/l/												
Glides									/j/ /̤j/							/w/ /w̤/		
Trill						/r/												

TABLE 1: Consonant inventory of Chicahuaxtla Triqui

[4] † Only in words borrowed from Spanish; no tokens of /p/ are included in the digital archive in this article.

Rhotic /r/ in word-initial position is most commonly pronounced as a voiced alveolar trill [r] but may also occur as a voiceless alveolar trill [r̥]. DiCanio (2010:230) makes a similar observation on /r/ allophony for Itunyoso Triqui. It is not clear, however, at this stage whether this variability can be viewed as a characteristic of the language family or not. More data on the allophonic distribution of /r/ would be needed for all three variants of Triqui and other Otomanguean languages in order to substantiate such a claim. It is important to note that /r/ also occurs in free variation with [dř] in initial position in words such as *rugui'i'* 'peach' [ⁿdřu³ɣwiʔ⁴i³] (cf. Item 63), *rugui'i̱* 'sad' [dřuɣwi'ʔi³] (cf. Item 64). Previous studies by Hollenbach (1977:53) lend credence to this claim. Although Hollenbach (1977:53) notes that /r~dr/ occur in free variation in Chicahuaxtla Triqui, it is not clear whether this alternation is also evidenced in Copala or in Itunyoso Triqui as well.[5]

The assibilation of /r/[6] also surfaces in word-initial position in Chicahuaxtla Triqui (cf. Item 89: *rumi* 'ball' [řumi³] and Item 99: *ro'ô* 'our hand' [řoʔ³oʔ⁴], a pronunciation which seemed to be favored by the main consultant whose recordings are included in this report. Assibilated /r/ may also occur as a voiceless alveolar slit fricative [ř̥] and evidences free variation with [ř]. Dalbor (1980:125) notes that in many varieties of Latin American Spanish, "the fricative variants of [ř] and [ř̥] alternate or replace the trilled [r]" and are even used by many educated native speakers, especially in vernacular speech styles. Although it is tempting here to conclude that Spanish has influenced the pronunciation of Chicahuaxtla Triqui [r], doing so would constitute a great leap of faith at this time.[7]

The degree of assibilation of word-initial /r/ varied among our consultants. Some consultants consistently pronounced /r/ as a voiced alveolar trill, while others evidenced a great deal of variation in their pronunciation of this sound. In intervocalic position, /r/ may be pronounced as a voiced alveolar flap or tap [ɾ], or it may be assibilated [ř] in this environment. The voiced alveolar flap [ɾ] was not found to occur in word-initial position.

Lastly, the consonant /ʔ/ can be observed in word-initial position (cf. *'ïn* [ʔɯ̃²] 'nine', Item 184; *'ngò* [ʔŋgo¹] 'one'; *'hio̱o* [ʔjo²³] 'humid'), in addition to medial (cf. *ne'ej* [neʔ³eʰ³] 'little child', Item 6; *go'ô* [goʔo⁴] 'our plate', Item 34) and final position (cf. *rumi̱'* [rumiʔ²] 'dark', Item 92; *guruhui̱'* [ⁿguɾuwiʔ²] 'we are going to roast it', Item 17, among others.) Words containing two glottal stops may also occur in Chichuaxtla Triqui, usually

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[5] Other variations in Chicahuaxtla Triqui, as reported by Hollenbach, include /zd~d, zn~n, ng~g/. The consonant combinations /zd, zn/ can also be articulated as /sd, sn/ and occur in free variation in Chicahuaxtla Triqui. We were able to find an additional alternation /t~st/ in Chicahuaxtla Triqui. For example, the word tane 'goat' may be pronounced as [ta3ne2] or [sta3ne2] depending upon the speaker.

[6] The assibilated variant of /r/ is transcribed in this article with a hačekAlthough this diacritic is not recognized by the IPA as representative of assibilated consonants, and assibilated /r/ might be more aptly transcribed as superscript /ʃ/ or /ʒ/ as per the IPA, we opted for [ř] or [ř̥] to avoid possible confusion with /ʃ/ and /ʒ/, which represent different phonemes in Chicahuaxtla Triqui. In addition, the practice of transcribing assibilated /r/ with a hačekis common among Hispanic linguists.

[7] Although Belmar's 1897 dictionary, Lenguas Indígenas del Estado de Oaxaca: Ensayo sobre la lengua trike, contains a section outlining the pronunciation of the majority of sounds in Chicahuaxtla Triqui, he does not describe the pronunciation of /r/.

in word-medial and final positions (cf. *ro'ô'* [řoʔ^{3}oʔ^{4}] 'our hand', Item 99; *du'ô'* [duʔoʔ^{4}] 'our mouths', Item 181; *du'huî'* [duʔwiʔ^{4}] 'our aunt', Item 37.)

3.2 VOWEL INVENTORY. Chicahuaxtla Triqui has a total of 14 vowels: six oral vowels /a e i ɯ o u/ and six nasal vowels /ã ẽ ĩ ɯ̃ õ ũ/. There are two other oral vowels, one open-mid back vowel /ʌ/ and one open-mid front vowel /ɛ/, as in *ë'ëj yiô'* [ɛʔɛ^{h32}ʒioʔ^{4}] 'hiccough' and the interjection *ê̈ëj*^{43} [ɛ^{h43}] 'What?' (cf. Item 200); however, they are not as common in Chicahuaxtla Triqui. The grapheme < ï > may be pronounced as [ɨ] or [ɨ̃] but may also be realized as [ɯ] or as the nasalized variant [ɯ̃] when followed by grapheme < n >, as in *snaquïnj ïn* [snakɯ̃h^{3}ɯ̃] 'possum'

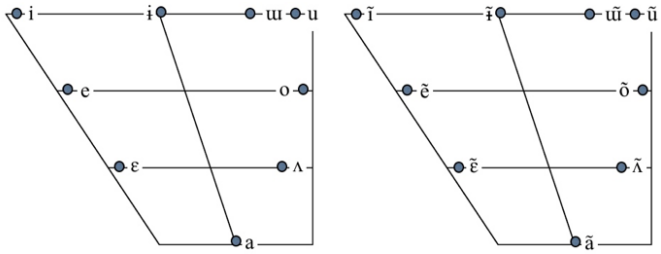


FIGURE 1: Chicahuaxtla Triqui vowel inventory

3.3 TONE. All Otomanguean languages are tonal. The total number of tones in Chicahuaxtla Triqui is still open for debate (Good 1979; Longacre 1952, 1957, 1959; Longacre, Edmondson & Santiago Rojas n.d.; Matsukawa 2007, 2009). Good (1979) estimates there may be as many as 10 contour tones in Chicahuaxtla Triqui, whereas Longacre (1957) suggests there may be as many as 15. In a recent study, Matsukawa (2009:1) identified at least one rising tone /13/ and three falling tones /43 32 31/. Matsukawa (2009:2) notes that in Chicahuaxtla Triqui and Copala Triqui, "a word has a phonemic tone only on the final syllable and non-final tones are phonemically toneless." Although Matsukawa's observation is generally true, there are some constructions in Chicahuaxtla Triqui, such as in the formation of the future and the past, in which the contrasting phonemic tone is found in the first (i.e., penultimate or antepenultimate) syllable. For example, *ñúnj gané* [ñũh^{5} ga^{3}ne^{5}] 'I sat down' versus *ñúnj gané* [ñũh^{5} ga^{2}ne^{5}] 'I will sit'. Hollenbach (2005:86–88) reports that the formation of the future and past tenses is similar in Copala Triqui. She (Hollenbach 1977:55) notes that although all syllables in Chicahuaxtla Triqui have the potential for carrying tone, phonemically contrastive tones are most commonly found in syllable-final position. In this position, tones /4 3 2 1/ may occur, but not /5/. In penultimate syllables, /4 3 2 1/ may be found, and antepenultimate syllables are limited to tones /3 2 1/. In word-final position, Hollenbach (1977:56) reports finding two sequences of three-tone segments /323 312/ in open syllables. Our preliminary analysis of the recordings seems to suggest that the Chicahuaxtla Triqui word *mii̱* [m̟i^{323}] 'bridge' (Item 14) confirms at least one of the three-tone segments reported by Hollenbach. During our visit to the local school in Chicahuaxtla, we found an additional three-tone combination /232/ in two words: [ã^{232}] or [a^{232}] 'yes', used formally as a sign of respect ('Sí, usted') and [o^{232}] 'yes', when speaking informally with friends and relatives ('Sí, tú').

VIDEO 1: (YouTube link) Visit to the local school in Chicahuaxtla. The class demonstrates the three-tone combination /232/ in the words for formal and informal 'yes'.[8]

Both Hollenbach (1984) and DiCanio (2008) provide thorough analyses of Triqui variants, in which they explore the distribution of tones in non-final syllables. Their conclusions, however, seem to run counter to Matsukawa's (2009:2) claim that non-final syllables are phonemically toneless. As does Hollenbach, DiCanio cites words with non-final tone /2/ and /4/ which do not appear to be morphologically derived. DiCanio concludes that a constraint based on tonal features governs the distribution of non-final syllable tones, e.g., "Either a non-final tone is specified as /3/ or it must agree in terms of tonal features with the tone on the final syllable" (DiCanio 2008:157). DiCanio argues for a more nuanced idea of tone rather than presenting it as a dichotomy, stating that tone is either contrastive or not. DiCanio's research is quite relevant here because he considered words that were not morphologically derived, but still demonstrates contrasts between tones in non-final syllables. Future research in this area should prove to be fruitful and absolutely necessary for a more comprehensive understanding of Triqui tonal features.

Phonemic pitch levels in this article are designated from 1 to 5, with 1 symbolizing the lowest tone and 5 the highest. In order to visually depict tonal differences in Chicahuaxtla Triqui, pitch trajectories (F0) were extracted from the following digitized audio samples using Praat. For example, Tone 5: *kúû* [ku^{54}] 'bone' (cf. Item 167); Tone 4: *nân* [n̪ã^{4}] 'heat from the sun' (cf. Item 46]; Tone 3: *kan* [kã^{3}] 'gourd' (cf. Item 10); Tone 2: *dạj* [^{n}dah^{2}] 'delicious' (cf. Item 31); and Tone 1: *huì* [w̪i^{1}] 'hidden' (cf. Item 23). The results of the Praat pitch trajectory analyses were plotted in MS Excel, and are listed in Figure 2.

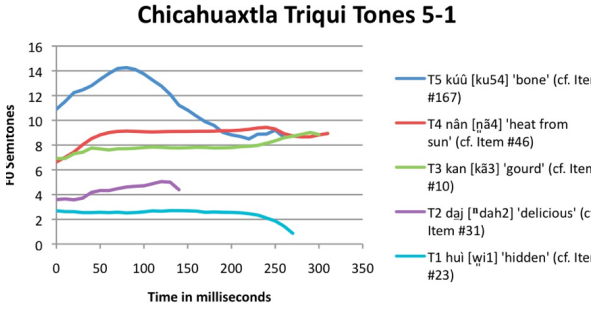


FIGURE 2: Chicahuaxtla Triqui tone trajectories. Triqui words are written in accordance with the most recently adopted spelling system (Santiago Rojas 2009) and IPA, plotted using F0 semitones in relation to time in milliseconds.

[8] Video is also archived in ScholarSpace at http://hdl.handle.net/10125/4509.

A cursory examination of the visual tone plot for this particular consultant shows that the differences in semitones between T1 and T2 (i.e., low tones) and T3 and T4 are minimal (i.e., mid tones). T5 (i.e., high tone), however, is substantially higher than T4 and appears to be in a class of its own, with an average of five semitones higher at its peak in relation to T4.[9] We will see in the section below, which discusses orthographic conventions, that given the close proximity of some of the tones (i.e., T1 with T2 and T3 with T4), many of the Chicahuaxtla Triqui teachers are in favor of a three-tone writing system as opposed to one that indicates all five tones.

Given the very complex nature of the Chicahuaxtla Triqui tonal system, very few articles have examined phonemically contrastive tone in Triqui beyond the word level. Although it lies beyond the scope of this study, it is important to note that when words ending with two- or three-tone segments are used in running speech, the final tone is eliminated at the sentence level or when used in compound words. For example, when the Triqui word for 'bone', *kúû* [ku^{54}] (Item 167), is used in a compound word such as *kú du'ô'* [ku^{5} duʔoʔ^{4}] 'jawbone' (literally 'bone [of our] mouth') (Item 168), the final tone in *kúû* [ku^{54}] is deleted when the word appears in a larger context such as the phrasal, sentential, or utterance level. This is a common feature in Chicahuaxtla Triqui and has also been reported in the Itunyoso and Copala variants. For a more thorough discussion of this phenomenon, see DiCanio (2008) in addition to Longacre, Edmondson & Santiago Rojas (n.d.) who posit the existence of floating tones in Chicahuaxtla Triqui. The following tokens illustrate word-final tone reduction for the Chicahuaxtla Triqui words *kaa* [ka:^{3}] 'ear of corn' and *nato͡o* [nato:^{23}] 'banana', first in isolation and then at the sentential level:

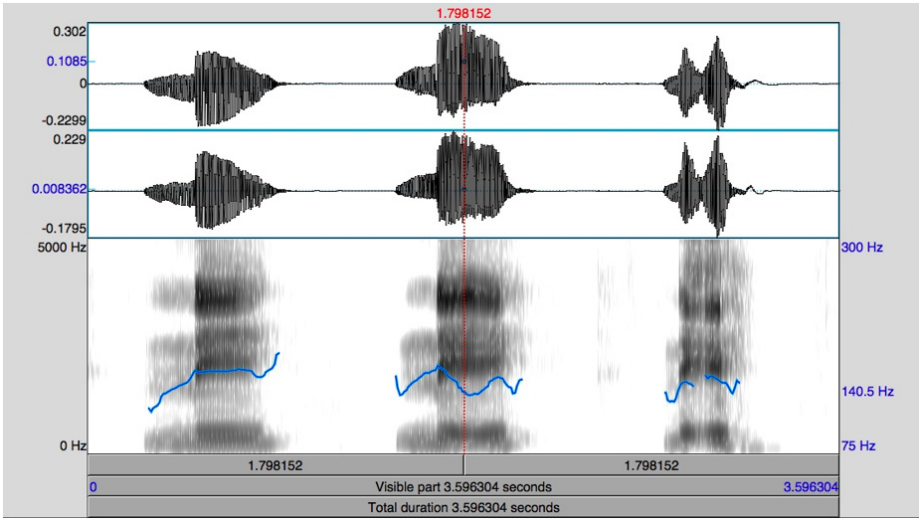
Word in isolation	**Sample of tone reduction in running speech**
kaa [ka:^{3}] 'espiga' 'ear of corn'	Màn ka [ka3] mare ruhuâ go'o. There.are ear.of.corn red inside plate 'There are red ears of corn on the plate.'
nato͡o [nato:^{23}] 'plátano' 'banana/plantain'	Tàj nato [nato2] maree rihaan mesa. On.top banana green face table 'There are green bananas on the table.'

3.4 FORTIS-LENIS CONSONANTS. Previous studies on Triqui (DiCanio 2008, 2012; Hollenbach 2005; Longacre 1959; Longacre, Edmondson & Santiago Rojas n.d.) and other Otomanguean languages discuss the existence of fortis-lenis consonant con-

[9] Longacre, Edmondson & Santiago Rojas (n.d.) report similar findings with regard to the close proximity of T1 to T2 and T3 to T4. Our other language consultants evidenced similar tone trajectories and close proximities for these tones as well. In addition, the tone trajectories reported here are similar to those reported by Longacre, Edmondson & Santiago Rojas who used Triqui data recorded by Longacre in the early 1950s. This suggests that the Triqui tonal system has remained relatively stable over the past 60 years.

trasts. Longacre (1959:37) notes Chicahuaxtla Triqui has 10 fortis consonants: /p, t, k, kw, s, ʃ, m, n, y, w/ and 10 lenis consonants: /b, d, g, z, ʒ, m, n, y, w, l/. Longacre (1952:63) states that fortis consonants in Chicahuaxtla Triqui differ from lenis consonants by "a perceptible lengthening of the fortis phonemes, greater articulatory force and consistent voicelessness of the fortis stops and fortis sibilants, and consistent stop quality of p, t, and k as opposed to b, d, and g which have fricative/stop allophonic variation." The fortis-lenis contrast has several interpretations and can refer to: 1) contrasts in consonant length, 2) contrasts in voicing, or 3) contrasts relating to strength of articulation. In this paper, *fortis-lenis* refers to a contrast in consonant length and is synonymous with the singleton-geminate distinction as per DiCanio (2012) in his research on Itunyoso Triqui.

Several examples of fortis-lenis segmental phonemes are included in this article's sound files. For example, Figure 3 depicts the fortis-lenis contrast of [n̥ː, n̥], which are represented orthographically in this figure as <nn> and <n>, respectively. The fortis tokens in *nne* [n̥ː^{3}] 'plow' and *nne̲* [n̥ː^{32}] 'water' range from .20 to .24 seconds, respectively, whereas their lenis counterpart in *ne'ej* [n̥eʔ^{3}e^{h3}] 'little boy' is approximately .076 seconds in duration. Other fortis-lenis contrasts in Chicahuaxtla Triqui in addition to [n̥ː, n̥] are [m̥ː, m̥], [˛j, j̥] and [w̥ː, w̥], and are represented in the embedded sound files. Fortis-lenis contrasts are transcribed using strong [˛] and weak [˛] diacritics as recommended extensions to the IPA[10].



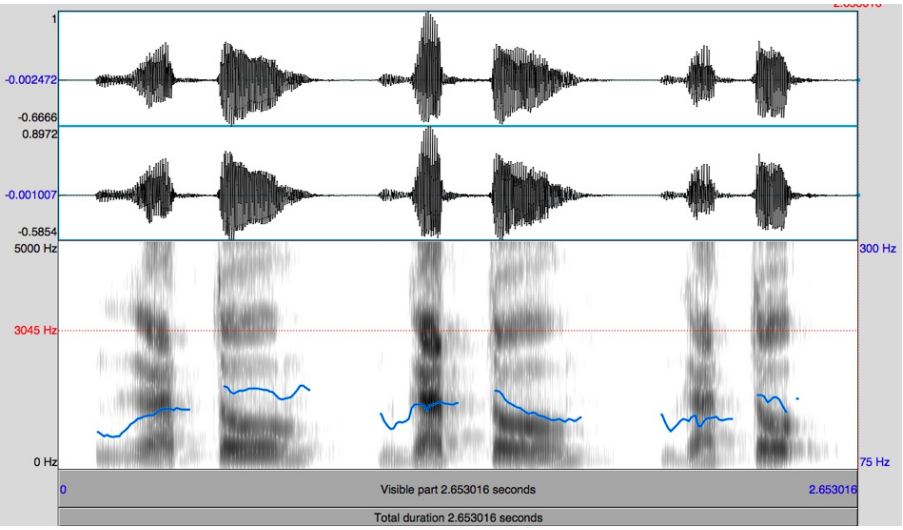
nne [n̥ː^{3}] 'plow' .245 s | *nne̲* [n̥ː^{32}] 'water' .207 s | *ne'ej* [n̥eʔ^{3}e^{h3}] 'little boy' .076 s

FIGURE 3: Contrastive duration of word-initial [n̥ː] and [n̥] (Items 4–6)

[10] See http://clispi.org/userfiles/ExtIPAChart2002.pdf, last accessed 2/03/2011

3.5 /ᵐb ⁿd ᵑg/: PRENASALIZED STOPS AND VELAR NASAL ONSETS. Prenasalized stops and velar nasal onsets occur in many varieties of Mixtecan languages. In Chicahuaxtla Triqui, /ᵑ/ is often phonetically present but operates non-contrastively in words that begin with the grapheme <g>. Figure 4 shows three separate occurrences of prenasalization for the Chicahuaxtla Triqui words [ᵑgato⁴ ᵑgato² ᵑgatoʔ²] 'shirt', 'mold', and 'we are going to tell him' (Items 1–3). The prenasalized velars in these tokens range in length from .08 to .13 seconds prior to the initial onset of the stop. When we queried two of our consultants using Praat and pinpointed the prenasalized portion of the recordings, both indicated that they had no conscious awareness of this sound and that it was not a perceptually salient feature for them.

Prenasalization may also occur as a conditioned variant before voiced stops /b/ and /d/. For example, /b/ can be articulated as [ᵐb] in words such as [ᵐberu⁴] 'Pedro' or [ᵐberente³] 'burning' from the Spanish loanword *ardiente*. However, when /b/ appears in intervocalic position, as in *neę berende* [n̪e³² βerende] '*aguardiente*/firewater' (literally, 'water burning'), /b/ is pronounced as [β] and does not evidence prenasalization in the token we collected. In Chicahuaxtla Triqui, it appears then that /ᵐb ⁿd/ and /ᵑg/ occur in free variation with /b d g/, respectively, where prenasalization or pre-voicing may or may not be present based on the tokens we collected for the present study.

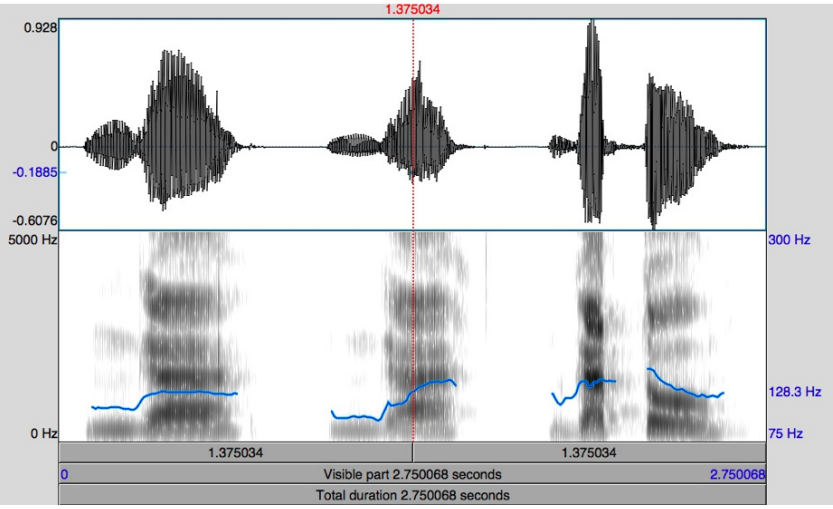


gatô [ᵑgato⁴]	gato̲ [ᵑgato²]	gato̲' [ᵑgatoʔ²]
'shirt'	'mold'	'We are going to tell him.'
.13 s	.11 s	.08 s

FIGURE 4: Prenasalized Consonants

In Chicahuaxtla Triqui the consonant combinations <ng> /ŋg/ and <nd> /nd/ occur phonemically and contrastively in initial position in words such as *nga* [ŋga³] 'cloud', *ngâ* [ŋga⁴] 'when', and *nda* [nda³] 'until'. The combination <ng> is also found in medial position after either a vowel or a glottal stop in words like *rangà'* [raŋgaʔ¹] 'one sees' or *a'ngo̲*

[aʔŋgo^{2}] ‘nobody, nothing’. Note that in Figure 5 the duration [ŋ] in *nga* [ŋga^{3}] ‘cloud’ and *ngâ* [ŋga^{4}] ‘when’ is approximately .21–.22 seconds, respectively, in comparison to [^{n}] as a non-contrastive prenasalized variant before [g], which in this case is .11 seconds, or about 50% less in duration. In this report, phonemically contrastive <ng> and <nd> in words such as *nga* [ŋga^{3}] ‘cloud’ or *nda* [nda] ‘until’ will be transcribed as [ŋg] and [nd], while their non-contrastive prenasalized variants in words such as *gato^{2}* [^{n}gato^{2}] ‘mold’ and *da’a̲j* [^{n}daʔah^{2}] ‘at times’ will be transcribed using superscripts—thus further underscoring their status as non-contrastive conditioned variants as well as their lack of perceptual saliency for native speakers of Chicahuaxtla Triqui.



nga [ŋga^{3}] ‘cloud’ .21 s | *ngâ* [ŋga^{4}] ‘when’ .22 s | *gato̲* [^{n}gato^{2}] ‘mold’ .11 s

FIGURE 5: Length of Velar Nasal Onset in comparison to prenasalized variant /^{n}g/

4. SPELLING CONVENTIONS. Chicahuaxtla Triqui is not a commonly written language. Although district teachers and interested community members have expressed an interest in developing a common orthographic system, reaching a consensus has not always been easy, and to date, some groups of teachers do not agree with others. Consequently, two different factions have emerged: one that proposes the use of a three-tone system and another in favor of a five-tone system. According to one consultant, junior high and high school teachers have adopted a three-tone system consisting of diacritics that mark only high, mid, and low tones. The consultant maintains that younger teachers prefer a three-tone system because they believe “it’s less complicated than a five-tone one, which is really too difficult—having to add all the other tones—and in addition, three tones are much easier to teach” (pers. comm.; translation mine). Other consultants who favor a three-tone system noted that it is difficult at times to distinguish a mid tone (T3) from a semi-high one (T4), and a semi-low tone (T2) from a low tone (T1)—an observation that is supported by the plot of the tone trajectories previously reported in Figure 2.

On the other hand, primary school teachers and those reported as belonging to the "older generation" prefer an orthographic system based on five tones. Proponents of this approach state that "it is our intention that Triqui be like Spanish, English, and other languages, at least on an academic level. We intend to develop books that have all of the necessary elements [represented in writing] so we can have didactic materials that are beneficial to our students, our teachers, the community, academicians, and other people who are interested in knowing our language. When the writing system doesn't contain all the necessary elements, the result is poor writing, poor spelling, and consequently, very poor performance on the part of the teachers and students as well" (pers. comm.; translation mine).

The diacritics used in this report for indicating tone are based on the five-tone system developed in committee with Felipe Santiago Rojas, this paper's third author and a native of San Andrés Chicahuaxtla, and are interpreted as follows: (˝) = 5; (^) = 4; ( ) = 3; (_) = 2; (ˋ) = 1. Santiago Rojas (2009:3) notes that the diacritics were approved on March 23, 2009, in a meeting that took place in Santo Domingo del Estado, together with the teachers, interested parties, and the school districts of San Andrés Chicahuaxtla and San Isidro de Morelos. Note that the current system does not account for words consisting of three-tone segments, such as *mii̱* [m̤i^{323}] 'bridge' or *nìì* [ni^{313}] 'last night'. In fact, we were informed that there have been no discussions or plans made by the teachers, leaders, or community members to develop a system to account for three-tone segments.

Another area in which there has been considerable discussion among the teachers centers on the orthographic representation of fortis-lenis contrasts in word-initial position. Orthographic systems previously used by Longacre (1952, 1959), Good (1979), Hollenbach (1977), DiCanio (2008, 2010, 2012), and Longacre, Edmondson & Santiago Rojas (n.d.), distinguish fortis from lenis phonemes through the use of geminate consonants <nn>, <mm>, <yy>, and fortis [w̤] graphemically represented as <huu> in word-initial position. The most recent writing system, however, does not differentiate graphemically between fortis and lenis contrasts (pers. comm., videotaped interview). One consultant reported that the teachers "vehemently rejected the use of double consonants," however, he added that there are "still some people, although very few, who choose to write it the old way." Although all of our consultants clearly made a fortis-lenis distinction when saying isolated words, it may very well be the case that younger generations are losing this distinction in running speech; however, making such a claim would be premature at this point.

Table 3 lists the grapheme-phoneme correspondence used in this article. Individual graphemes are listed in column 1 and are followed by their corresponding phonemic representation in column 2. Columns 3–5 list sample words in Chicahuaxtla Triqui, followed by their equivalents in Spanish and English.

An explanation of some of the graphemes is warranted, due to recent changes in spelling conventions. For example, both the fortis and lenis voiced palatal approximants [j̤] and [j̲] were previously written as <y> and <yy>, respectively, but today they are written as <hi> with no distinction between fortis or lenis articulations. In addition, fortis and lenis [w̤ w̲], formerly written as <huu> and <hu>, are now represented graphemically as <hu>. Although the most recent writing system adopted does not differentiate graphemically between fortis and lenis constrasts, note that the grapheme-phoneme table takes into account the few speakers who do make such a distinction in writing. The fortis-lenis distinction,

however, will not be made in the orthographic representation of the words presented in the wordlist and sentence tables, yet it will be indicated in the phonetic transcriptions.

Another substantive change in the orthographic system has to do with the voiceless velar stop [k]. Longacre (1952, 1957, 1959, 2004), Good (1979), Hollenbach (1977), DiCanio (2008, 2012), Matsukawa (2009), and Longacre, Edmondson & Santiago Rojas (n.d.) represented the voiceless velar stop [k] graphemically as <c> before back vowels and <qu> before front vowels, modeled after Spanish spelling conventions. However, in this report [k] is written as <k> in accordance with the orthographic system currently in use.

Words containing the laryngeal /h/ and followed by a vowel are now written by some teachers with a space between the laryngeal and the vowel, whereas at one time, they were written as one word. For example, *neje rè'* [neh^{3}e ɾeʔ^{1}] 'you-PL' (Item 152), *neè chrunjun* [n̤e^{31}tʂũh^{3}ũ] 'barbecue' (Item 9), and *yiaja* [jaha^{3}] 'flower' (Item 161), are now written as *nej e rè', neè chrunj un,* and *hiaj a,* respectively. When queried, the consultants reported that although the separate element at the end of the word has no morphological value, either inflectional or derivational, "writing the word without the space would result in unnatural pronunciation." One consultant noted that "the same thing happens with the word *kïj ï* [kɯhɯ^{3}] 'mountain' (Item 196). We native speakers know that there is a brief pause [after the *j*] and if we were to write it as one word, the sound of the final syllable would be distorted" (pers. comm., translation mine).

Aside from the few spelling changes reported in this article, several of the graphemes in the current system remain unchanged from earlier spelling conventions used by Longacre (1952), Hollenbach (1977), and Good (1979). For example, the lenis denti-alveolar affricate [ts] is still represented graphemically as <ts>, the fortis affricate [tʃ] is represented as <ch>, and the retroflex affricate [tʂ] is written as <chr>. Grapheme <n> in word-initial position or at the beginning of a syllable is pronounced as a voiced alveolar nasal [n]; however, when a vowel is followed by <n> in syllable- or word-final position, it signals nasalization of the previous vowel.

Grapheme	Phoneme	Chicahuaxtla Triqui Example	Spanish Translation	English Translation
<a>	/a/	na	cama	bed
<b>	/b/ or /^{m}b/	besu < *Span*	beso	kiss
<ch>	/tʃ/	chi̤j	siete	seven
<chr>	/tʂ/	chra	tortilla	tortilla
<d>	/d/ or /^{n}d/	dane	codo (del brazo)	elbow
<e>	/e/	nej e	sueño	dream
<ë>	/ɛ/ or /ə/	hiëj	piedra	stone
<g>	/g/ or /^{ŋ}g/	gatô	camisa	shirt
<h>	/-/	du'hui	rayo	lightening
<hi>	/j/ or /̤j /	hia'aj; hio' (fortis)	chile; nuestra lengua	chili; our tongue
<i>	/i/	huì	escondido	hidden
< ï >	/ɨ/ or /ɯ/	kïn	río	river
<j>	/h/	kïj ï	cerro	hill
<k>	/k/	kaj a	viga	beam; joist

<l>	/l/	lampa	bobo	silly; fool
<m> or <mm>	/m/ or /m̤/	da'mu̲ù̲n; mi̲i̲ (fortis); mi'i (fortis)	piernas; camote; jabón	legs; sweet potato; soap
<n> or <nn>	/n/ or /n̤/	natoo; nanj (fortis)	plátano; ayate	banana; thread of maguey fabric
<nd>	/nd/	nda̲a	hasta	until
<ng>	/ŋg/	nga	cuando	when
<ñ>	/n̪/	ña̲an	sal	salt
<o>	/o/	toò	leche	milk
<p>	/p/	Lupe < *Span*	Guadalupe	Guadalupe
<r>	/r/	ruda'a	mano de metate	metate handle
V+<r>+V	/ɾ/	guruhu̲i	chango	monkey
<s>	/s/	sí̲i	hombre	man
<sn>	/sn/	snadu	soldado	soldier
<st>	/st/	stu'huaj a	brujo	warlock/witch
<t>	/t/	ta	llano	plane
<ts>	/ts/	tsi'i	pulque	pulque
<u>	/u/	tuu	ladrón	thief
<x>	/ʃ/	xi	grande	big
<y>	/ʒ/	yo	tortuga	turtle
<'>	/ʔ/	ne'ej	nene	child

TABLE 3: Chicahuaxtla Triqui grapheme-phoneme correspondence

5. CONCLUSION. Language documentation is a complex process aimed at creating a comprehensive record of many of the world's languages at risk of disappearing within the next century. With the advent of the internet and recent technological advances, language documentation and conservation efforts have been revolutionized. Previous articles on language documentation relied solely on the transcription skills of the writer and did not afford the reader the opportunity to listen to actual language data in order to arrive at his or her own conclusions regarding the language, nor to appreciate fully the vast richness of the language being documented. Linguists are now able to include video and/or audio recordings and incorporate them within the corpus of the text, in addition to providing other explanatory materials and analyses. The ability to make language data available, accessible, searchable, and downloadable on a wide-scale basis was pure science fiction as recently as 15 years ago. It would appear that future possibilities are endless for digital archiving of endangered or minority language data and the dissemination of our findings. Projects of this nature are only made possible, however, through the concerted efforts of many participants: the linguist, the consultants, and frequently entire speech communities who collaborate on these endeavors as well. This project involves leaders, teachers, and community members from San Andrés Chicahuaxtla, in addition to researchers and graduate and undergraduate students of the University of Texas at Arlington. It is our hope that the digitized recordings included in this report will help further our understanding of Chicahuaxtla Triqui, a language that is not entirely understood by linguists. The digital files presented here represent one of a number of ways to increase access to language data, not only for the Chicahuaxtla Triqui community members, village leaders and teachers, but also for linguists, researchers, and students who wish to learn more about the Otomanguean stock of languages.

6. WORDLIST.

6.1 SECTION 1: MINIMAL PAIRS WITH PHONEMICALLY CONTRASTIVE TONE. *See footnotes at end of table.*

Item	English	Spanish	mp3	Orthographic representation	Broad phonetic transcription	Notes
1–3	shirt	camisa		gatô	[ᵑgato^{4}]	prenasalized velar
	mold	moho		gat̲o̲	[ᵑgato^{2}]	prenasalized velar
	We are going to tell him.	Le vamos a decir.		gat̲o̲’	[ᵑgatoʔ^{2}]	prenasalized velar
4–6	plow	arado		ne	[n̥e^{3}]	fortis
	water	agua		ne̲e̲	[n̥e^{32}]	fortis
	little boy	nene		ne’ej	[n̥eʔ^{3}e^{h3}]	lenis
7–9	tree	árbol		chrun	[tʂ̬ũ^{3}]	retroflex; word-final *-n* for vowel nasalization
	box	caja		chrúun	[tʂ̬ũ^{53}]	retroflex
	barbecue	barbacoa		neè chrunj un	[n̥e^{31}tʂ̬ũh^{3}ũ]	fortis; *neè* = meat; *chrunj un* = related to soot, wood or trees. *Neè ruhu̲a guchrún = carne adentro horno* ‘meat inside of the oven’
10–12	gourd	calabaza		kan	[kã^{3}]	chick peeping in background
	seed	semilla		ka̲a̲n	[kã^{32}]	
	sandal	huarache		kanj	[kã^{h3}]	
13–15	sweet potato	camote		mi̲i̲	[m̥i^{32}]	fortis m
	bridge	puente		mi̲i̲	[m̥i^{323}]	fortis m
	soap	jabón		mi’i	[m̥iʔ^{3}i^{h}]	fortis m
16–17	monkey	chango		guruhui	[ᵑgurɯw̥i^{3}]	prenasalization
	We are going to roast it.	Lo vamos a asar.		guruhu̲i̲’	[ᵑgurɯwiʔ^{2}]	

18–19	crooked	chueco		gu̲hiu̲	[ⁿgu²ju²]	dog barking in background; prenasalization
	raccoon	mapache		guhiuj	[ⁿgujuh³]	prenasalization
20–21	heart	corazón		nimân	[nimãh⁴]	
	deceased	difunto		niman	[nimã³]	
22–23	two	dos		hùi	[ẅi¹³]	
	hidden	escondido		huì	[ẅi¹]	
24–26	cricket	grillo		chru	[t̪su³]	Small chicken peeping in background; edited with SoundSoap 2.1
	powder	pólvora		chru̲ù	[t̪su²¹]	
	egg	huevo		chruj	[t̪suʰ³]	
27–29	fine	fino		hue'ê	[weʔe⁴]	
	house	casa		hue'e	[weʔ³e]	Consultant turned his head
	matting	petate		huée	[ẅe⁵³]	fortis
30–32	bluish	medio azul		daj	[ⁿdah³]	prenasalization / prevoicing
	delicious	sabroso		da̲j	[ⁿdah²]	prenasalization / prevoicing
	at times	a veces		da'a̲j	[ⁿdaʔah²]	prenasalization / prevoicing
34–35	our plate	nuestro plato		go'o	[goʔo⁴]	no prenasalization
	We are going to drink it.	Lo vamos a tomar.		go̲'o̲'	[ⁿgoʔ²oʔ²]	prenasalization
36–37	lightning	rayo		du'hui	[ⁿduʔwi³]	prenasalization
	our aunt	nuestra tía		du'huî'	[duʔwiʔ⁴]	no prenasalization
38–39	red	rojo		sa mare	[sa³maɾe³]	*sa* = 'thing'; literal meaning = 'red thing'
	green	verde		sa mareè	[sa³maɾe³¹]	
40–41	our brother	nuestro hermano		dîn̂î'	[ⁿdin̂î']	prenasalization
	cactus	nopal		din̈ï̈	[ⁿdinɯʔ⁴]	prenasalization
42–43	more	más		doj	[ⁿdoh³]	prenasalization
	less	poco		dòj	[ⁿdoh¹]	prenasalization

44–45	avocado	aguacate		rûne	[ru^{4}ne^{3}]	voiced alveolar trill
	beans	frijoles		rune	[ru^{3}ne:^{2}]	
46–47	heat from the sun	calor del sol		nân	[n̤ã^{4}]	fortis
	mom	mamá		nâan	[n̤ã^{43}]	fortis
48–49	bed	cama		na	[n̤a^{3}]	fortis
	corn	milpa		naà	[n̤a^{31}]	fortis
50–52	brush	cepillo		hia'a	[jaʔa^{3}]	
	root	raíz		hia'a	[jaʔa^{2}]	Also means *'bejuco del árbol'* or 'Tarzan vine'
	chile pepper	chile		hia'aj	[jaʔah^{3}]	
53–55	scar	cicatriz		ñaàn	[n̰ã^{31}]	
	forward	adelante		ne' ña̲n	[neʔ^{3}n̰ã^{2}]	*ne'* = preposition meaning 'through' or 'toward'
	salt	sal		ña̲an	[n̰ã^{32}]	
56–58	hot plate	comal		yihio̲o	[ʒio^{2}]	
	our neck	nuestro cuello		yihiô'	[ʒioʔ^{4}]	
59–60	food/meal	comida		nihia̲a̲	[ni^{3}a^{2}]	
	sweat	sudor		nihià	[nia^{1}]	
61–62	tree resin used for incense	copal		sikíi	[siki^{53}]	
	delicate	delicado		si̲ki	[zi^{2}ki^{3}]	
63–64 [10]	peach	durazno		ruguî'i^{2}	[^{n}dřu^{3}ɣwiʔ^{4}i^{3}]	prenasalization; consultant pronounces initial *r-* as [dř]
	sad	triste		rugui̲'i	[^{n}dřu^{2}ɣwiʔ^{2}i^{3}]	prenasalization; consultant pronounces initial r- as [dř]
65–68	ear of corn	elote		tsii̲	[tsi^{32}]	
	hard; leathery	duro; correoso		tsì	[tsi^{1}]	
	teat	teta		tsí	[tsi^{5}]	
	candy; sweet	dulce		sitsi̲'i	[zitsi^{2}ʔi^{3}]	

69–70	skirt; tangle/ knot	falda; enredo		sînï	[zi^{4}nɯ^{3}]	
	first	primero		sin̲ï̲	[sinɯ^{23}]	
71–72	worm	gusano		yilúu	[ʒilu^{h53}]	
	cat	gato		yilu	[ʒilu^{3}]	
73–74	grinding stone	metate		to̲o̲	[to^{32}]	
	milk	leche		toò	[to^{31}]	
75–76	fly	mosca		yutáan	[ʒutã^{53}]	
	bee	abeja		yutan	[ʒutã^{3}]	
77–78	cloud	nube		nga	[ŋga^{3}]	
	when	cuando		ngaâ	[ŋga^{4}]	
79–82	year; age	año; edad		hio'o	[joʔo^{3}]	
	our tongue	nuestra lengua		hio'	[joʔ^{3}]	
	dirt/Earth	tierra		hio'óo	[jo^{3}ʔo^{53}]	
	our forehead	nuestra frente		hiô'	[joʔ^{4}]	
83–85	our grand-father	nuestro abuelo		yî'	[ʒiʔ^{4}]	
	sickness	enfermedad		yi'ìi	[ʒiʔi^{13}]	
	our foot	nuestro pie		yi'î'	[ʒiʔiʔ^{4}]	
86–88	skin; leather	piel; cuero		nïj	[n̥ɨh^{3}] or [n̥ɯh^{3}]	
	tame; docile	manso		ni̲j	[nih^{2}]	
	last night	anoche		niì	[ni^{31}]	
89–91	ball	pelota		rumi	[ř̆umi^{3}]	assibilated /r/
	dark	oscuro		rumi̲'	[rumiʔ^{2}]	
	We are lazy.	Somos perezosos.		rumì	[rumi^{1}]	
92–94	loan	préstamo		yikïn	[ʒikɾ̃^{3}] or [ʒikũ^{3}]	
	scorpion	alacrán		yikï̲ïn	[ʒikɾ̃^{23}] or [ʒikũ^{23}]	
	first grinding of corn	primera molienda del maíz		yikï̲'ï̲	[ʒikɯʔ^{2}ɯ^{2}]	

95–97	tasty	sabroso		yiàn’	[ʒiãʔ^{1}]	
	crab	cangrejo		yian	[ʒiã^{3}]	
	my town	mi pueblo		yiân	[ʒiã^{4}]	
98–99	bull	toro		rô	[řo^{4}]	
	our hand	nuestra mano		ro’ô’	[řoʔ^{3}oʔ^{4}]	
100–101	turtle	tortuga		yo	[ʒo^{3}]	
	We eat it.	Lo comemos		yô’	[ʒoʔ^{4}]	note [11]
102–103	toasted	tostado		nitïîn	[nitũ^{4}]	
	chayote	chayote		nitïïn	[nitũ^{3}]	
104–106	you (fam.)	tú		sò’	[soʔ^{1}]	
	he	él		sô’	[zoʔ^{4}]	
	deaf	sordo		so’o	[soʔo^{3}]	
107–108	tortilla	tortilla		chra	[tʂa^{3}]	
	music/song	música/ canción		chrâ’a	[tʂaʔ^{4}a^{3}]	
109–111	You (fam. sg.) speak the truth.	hablas verdad		a’mi hia	[aʔmi ˷ja^{3}]	fortis [j]
	You (fam. sing) speak a lie.	hablas mentira		a’mi hia	[aʔmi˷ ja^{2}]	fortis [j]
	now	ahora		hiàaj	[˷jah^{12}]	fortis [j]
112–114	I speak/am speaking.	Yo hablo.		ñùnj a’mîi	[ɲũh^{1} aʔmi^{43}]	
	I spoke.	Yo hablé.		ñùnj gâ’mîi	[ɲũh^{1} ᵑgaʔ^{4}mi^{43}]	prenasalization of [g]
	I will speak.	Yo voy a hablar.		ñùnj ga’mîi	[ɲũh^{1} ᵑgaʔ^{2}mi^{43}]	prenasalization of [g]
115–116	He speaks. (spoken by a man)	El habla. (hablado por hombre)		sij a’mii	[sih aʔmi^{32}]	
	He speaks. (spoken by a woman)	El habla. (hablado por mujer)		ñûnj a’mii	[ɲũh^{4} aʔmi^{32}]	Consultant plays the role of a woman
117–118	I bathe myself.	Yo me baño.		ñùnj anee	[ɲũh^{1} ane^{32}]	
	He bathes himself.	El se baña.		sij anee	[si^{h} ane^{32}]	

	You (fam.) bathed yourself.	Tú te bañaste.		sò' gânee̲	[zo̲ʔ^{1} ga^{4}ne^{32}]	creaky voice
119–120	She speaks. (spoken by a woman)	Ella habla. (hablado por una mujer)		mâ a'mii̲	[ma^{4} aʔmi^{32}]	Consultant plays the role of a woman
	She speaks. (spoken by a man)	Ella habla. (hablado por un hombre)		ñûn' a'mii̲	[ɲũ^{4}ʔ aʔmi^{32}]	*ñûn'*, when spoken by a man = 'she'; when spoken by a woman = 'he'
121–122	They eat. (spoken by a man)	Ellos comen. (hablado por un hombre)		nej sij yâ[10]	[neh^{3} sih^{3} ʒa^{4}]	
	They eat. (spoken by a woman)	Ellos comen. (hablado por una mujer)		nij yâ	[nih^{3} ʒa^{4}]	
123–124	Speak (fam. command).	Habla (tú).		Ga̲'mi sò' â	[gaʔ^{2} miʔ^{3} soʔ^{1} a^{4}]	Sentence-final *a* = exclamation particle
	Don't speak (fam.).	No hables (tú).		Si̲' gâ'mi' mânj	[siʔ^{2} gaʔ^{4}miʔ^{3} mãh^{4}]	
125–127	We (excl.) are speaking.	Nosotros (excl.) hablamos.		Nej ñûnj a'mii̲	[neh^{3} ɲũh^{4} aʔmi^{32}]	
	We (incl.) are speaking.	Nosotros (incl.) hablamos.		Nê' a'mii̲	[neʔ^{4} aʔmi^{32}]	
	We all are speaking.	Nosotros todos hablamos.		Nej ne̲' nê' a'mii̲	[neh^{3} neʔ^{2} neʔ^{4} aʔmi^{32}]	nej^{3} (pl.) ne'^{2} (1st pers. incl.) ne'^{4} = 'all'
128–129	You (fam.) speak.	Tú hablas.		Sò' â'mii̲	[soʔ^{1} aʔ^{4}mi^{32}]	
	You (fam.) spoke	Tú hablaste.		Sò' gâ'mii̲	[soʔ^{1} ga̲ʔ^{4}mi^{32}]	
130–131	You (form. pl.) speak.	Uds. hablan.		Nej e rè' a'mii̲	[neh^{3}e ɾeʔ^{1} aʔmi^{32}]	
	You (form. pl.) do not speak.	Uds. no hablan.		Nej e rè' nun a'mii̲	[neh^{3}e ɾeʔ^{1} nũ^{3} aʔmi^{32}]	

132–134	earthquake	temblor		ñûn	[ɲũ^{4}]	yun^{4} per Good (1979)
	our tooth	nuestro diente		ñuûn’	[ɲũʔ^{34}]	yun’^{4} per Good (1979)
	I (subj. pro.)	Yo		ñùnj	[ɲũh^{1}]	yunj^{1} per Good (1979)
135–136	cold	frío		nuhuij	[nuwih^{3}]	
	church	iglesia		nuhuį	[nu^{3}wi^{2}]	
137–138	wind	viento		nanè	[nane^{1}]	
	our language	nuestro idioma		nanè a’miî	[nane^{1} aʔmi^{4}]	Literally “the air we speak/ pronounce.”
139–140	fever	calentura, fiebre		gachį’į	[^{n}gatʃiʔ^{2}i]	prenasalization
	We are going to grow.	Vamos a crecer.		gachį’	[^{n}gatʃiʔ^{2}]	prenasalization

6.2 SECTION 2.

141	I	yo		ñùnj	[ɲũh^{1}]	
142	You (fam.; singular) sing.	tú		sò’	[soʔ^{1}]	
143.	You (formal; singular): You are speaking.	Usted: Ud. habla.		rè’	[aʔmi^{2} reʔ^{1}]	Used in carrier sentence
144.	he	él		sô’	[zoʔ^{4}]	After initial reference to the person
145.	he (spoken by a man)	él, hablado por hombres		sij^{3}	[zih^{3}]	When spoken by a man and when referring to the person; voicing of <s>
146.	He is a good man.	El es un hombre bueno.		Sij huuin sí sà’a.	[zih^{3} w̃ĩ^{3} zih^{5} zaʔ^{1}a]	Used in carrier sentence.
147.	she (spoken by a man)	ella, hablado por hombres		ñûn’	[ɲũʔ^{4}]	When spoken by a man
148.	they (fem. pl.)	ellas, hablado por hombres		nej nij	[neh^{3} nih^{3}]	When spoken by a man

149.	they (masc. pl.)	ellos		nej sij	[neh^{3} sih^{3}]	
150.	we (incl.)	nosotros (inclusivo)		nej ne̲’	[neh^{3} neʔ^{2}]	
151.	we (excl.)	nosotros (exclusivo)		nej ñûnj	[neh^{3} ɲũh^{4}]	
152.	you (pl.)	Ustedes (plural)		nej e rè’	[neh^{3}e ɾeʔ^{1}]	
153.	we/us	nosotros/nos		ñùn’	[ɲũʔ^{1}]	
154.	big (a lot)	grande (mucho)		niko	[niko^{3}]	
155.	long	largo		ye’è	[ʒeʔe^{1}]	
156.	dog	perro		yuhue	[ʒuwe^{3}]	
157.	The dog jumps.	Brinca el perro.		huêj yuhue	[weh^{4} ʒuwe^{3}]	
158.	stick	palo		chrun	[ʈʂũ^{3}]	retroflex; same word for ‘tree’; ‘pencil’ = *lapij chrun* [lapi^{h} ʈʂũ^{3}] from the Spanish word *lápiz* ‘pencil’
159.	fruit	fruta		chruj tsi’i̲	[ʈʂuh^{3} tsiʔi^{2}]	Literally, ‘egg sweet’
160.	seed	semilla		ka̲a̲n	[kã^{32}]	Chicken peeping in background
161.	flower	flor		hiaj a	[jaha^{3}]	Storm in background
162.	grass	pasto		chrin’inj	[ʈʂĩʔĩh^{3}]	
163.	rope	mecate		ne’e	[n̤eʔ^{3}e]	fortis
164.	skin	piel		nïj	[n̤ɯh^{3}]	fortis
165.	meat	carne		neè	[n̤e^{31}]	fortis
166.	blood	sangre		tun	[tũ^{3}]	
167.	bone	hueso		kúû	[ku^{54}]	Rain in background
168.	jaw	mandíbula		kú du’ô’	[ku^{5} duʔoʔ^{4}]	Literally, ‘bone (of our) mouth.’ Rain in background.
169.	fat (from bull)	grasa de toro		nami̲i̲ rô	[nami^{32} ɾo^{4}]	
170.	fat (from goat)	grasa de chivo		nami̲i̲ tan̲e̲	[nami^{32} ta^{3}ne^{2}]	*stane*^{2} = ‘goat’ as per Good (1979)

171.	fat (from pig)	grasa de cerdo		namii̱ yaká	[nami^{32} ʒa^{3}ka^{5}]	
172.	We are getting fat.	engordamos		namii̱j	[namih^{32}]	
173.	pot	olla		ruh	[řuh^{3}]	assibilated /r/
174.	head	cabeza		ahuî’	[awiʔ^{4}]	
175.	hair	pelo		huê	[ʍe^{4}]	Rain in background
176.	eyebrow	ceja		huê yichra̱h rune̱ ñuu̱n’	[ʍe^{4} ʃitʂah^{2} rune^{2}ɲũʔ^{32}]	Literally, ‘hair on top of *(arriba del)* the eye’
177.	moustache	bigote		huê du’ô’	[ʍe^{4} duʔoʔ^{4}]	Literally, ‘hair of the mouth’. Consultant turned his head.
178.	ear	oreja		rakî’	[řakɯʔ^{4}]	rak<caret>ï’^{4} = *nuestra oreja*; rakïj^{3}
179.	eye	ojo		rune̱ ñuu̱n’	[řune^{2} ñũʔ^{32}]	
180.	nose	naríz		dakî̱n’	[dakũʔ^{4}]	
181.	mouth	nuestra boca		du’ô’	[duʔoʔ^{4}]	
182.	lip(s)	labio(s)		nïj du’ô’	[n̤ɯh^{3} duʔoʔ^{4}]	Literally, ‘skin (of our) mouth’
183.	shoulders	hombros		yikô’	[ʒikoʔ^{4}]	
184.	nine	nueve		‘ï̱n	[ʔɾ̃ŋ^{2}] or [ʔũŋ^{2}]	
185.	leg(s)	pierna(s)		da’mu̱ùn’	[daʔmuʔ^{21}]	
186.	our hand	nuestra mano		ro’ô’	[řoʔoʔ^{4}]	
187.	our neck	nuestro cuello		yihiô’	[ʒioʔ^{4}]	
188.	our back	nuestra espalda		yichrô’	[ʒitʂoʔ^{4}]	
189.	finger	dedo		dëj ro’ô’	[deh^{3} řoʔ^{3}oʔ^{4}]	Literally, ‘finger (of the) hand’
190.	toe	dedo del pie		dëj dakô’	[deh^{3} dakoʔ^{4}]	Literally, ‘finger (of the) foot’
191.	It smells like tortillas.	Huele a tortillas.		gïn chra	[gɾ̃^{3} tʂa^{3}] or [gũ^{3} tʂa^{3}]	

192.	It smells like bread.	Huele a pan.		gïn rachrúun	[gr̃^{3} ratʂũ^{53}] or [gũr^{3} ratʂũ^{53}]	'Bread' is a compound word: *(ch)ra + chrúun = tortilla al horno* 'oven-baked tortilla'
193.	sun/day	sol/día		gui	[gwi^{3}]	
194.	ashes	ceniza(s)		yaj	[jah^{3}]	Rain in background
195.	It's burning.	Se está quemando.		akaa̲ a'man	[aka^{32} aʔmã^{3}]	Literally, 'it is burning hot'. [aka^{32}] 'it is burning'; [aʔmã^{3}] 'caliente/hot'
196.	mountain	montaña		kïj ï	[kɨh^{3}ɨ] or [kɯh^{3}ɯ]	
197.	his mother and his son	su mamá y su hijo		ni n̲i da'n̲ì	[n̪i^{3} ni^{2} daʔni^{21}]	
198.	dry	seco		nakò	[nako^{1}]	
199.	far	lejos/lejano		gàn'	[gãʔ^{1}]	
200.	What?	¿Qué?		ê̂ëj	[əh^{43}]	

[11] We originally transcribed items 63–64 as [ndřu3wiʔ4i3] and [ndřuwiʔi3], respectively, having perceived <gu> pronounced as a voiced labiovelar approximant [w]. However, during a follow-up session with two Triqui consultants in the summer of 2011, they clearly interpreted these words as having voiced velar fricatives [ɣ].

[12] The Chicahuaxtla Triqui verb yô' [ʒoʔ4] 'we eat/we do eat/we are eating' (see item 101) is one of very few verbs in the language in which the present tense forms are indistinguishable from the past. For example: Ne' yô' [neʔ2 ʒoʔ4] means 'We (incl.) eat/do eat/we are eating' or 'We ate'.

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